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**Facing the Global Challenges:
the Importance of Land Governance and the Significance of the Cadastre**



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Place matters! Everything happens somewhere. If we can understand more about the nature of “place” where things happen, and the impact on the people and assets on that location, we can plan better, manage risk better, and use our resources better.

This paper provides an overall understanding of the land management paradigm and the importance of land governance in support of the global agenda. The paper emphasises the significant role of the cadastre in this regard.

Sustainable land administration systems provide clear identification of the individual land parcels and land rights attached to these parcels. This information on the people to land relationship is crucial and plays a key role in managing a wide range of activities in society including adaptation to climate change and disaster risk management.

THE GLOBAL AGENDA

“Do surveyors have a role to play in the global agenda?” - from a FIG (International Federation of Surveyors) point of view the answer to this question is clearly a “Yes”! Simply, no development will take place without having a spatial dimension, and no development will happen without the footprint of surveyors – the land professionals.

The eight Millennium Development Goals (MDGs) are placed at the heart of the global agenda. They form a blueprint agreed to by all the world’s countries and the world’s leading development institutions. The first seven goals are mutually reinforcing and are directed at reducing poverty in all its forms. The last goal - global partnership for

development - is about the means to achieve the first seven. To track the progress in achieving the MDGs a framework of targets and indicators is developed. This framework includes 18 targets and 48 indicators enabling the ongoing monitoring of the progress that is reported on annually (UN, 2000).

The MDGs represent a wider concept or a vision for the future, where the contribution of the global surveying community is central and vital. This relates to the areas of providing the relevant geographic information in terms of mapping and databases of the built and natural environment, and also providing secure tenure systems, systems for land valuation, land use management and land development. The work of the surveyors forms a kind of “backbone” in society that supports social justice, economic growth, and environmental sustainability. These aspects are all key components within the MDGs.

FROM MEASUREMENT TO MANAGEMENT

The role of the surveyors is changing at a global scale. There is a big swing that could be named “From Measurement to Management”. This does not imply that measurement is no longer a relevant discipline to surveying. The change is mainly in response to technology development. Collection of data is now easier, while assessment, interpretation and management of data still require highly skilled professionals. The role is changing into managing the measurements.

In the more technical and natural science area of surveying this move can be illustrated by the evolution from the concept of Geodetic Datums to Positioning Infrastructures. A geodetic datum is a (multi level) geodetic reference framework describing positions in three dimensions. It supports the traditional functions of surveying and mapping and underpins all of what we now call geo-spatial information. The concept of a Positioning Infrastructure widens the functions to enable the monitoring of global processes such as those associated with climate change and disaster risk management and also real time positioning for e.g. agricultural farming purposes. It can be argued that GNSS could be considered one of the only true global infrastructures in that the base level of quality and accessibility is constant across the globe (Higgins, 2009). Such a Positioning Infrastructure moves the focus from measurement of framework points to management of the data received from the positioning system.

The change from measurement to management also means that surveyors increasingly contribute to building sustainable societies as experts in managing land and properties. The surveyors play a key role in supporting an efficient land market and also effective land-use management. These functions underpin development and innovation for social justice, economic growth, and environmental sustainability. Land Administration Systems are the basis for conceptualizing rights, restrictions and responsibilities related to people, policies and places.

LAND GOVERNANCE

All countries have to deal with the management of land. They have to deal with the four functions of land tenure, land value, land use, and land development in some way or another. A country's capacity may be advanced and combine all the activities in one conceptual framework supported by sophisticated ICT models. More likely, however, capacity will involve very fragmented and basically analogue approaches.

Arguably sound land governance is the key to achieve sustainable development and to support the global agenda set by adoption of the Millennium Development Goals (MDGs). Land governance is about the policies, processes and institutions by which land, property and natural resources are managed. This includes decisions on access to land, land rights, land use, and land development. Land governance is basically about determining and implementing sustainable land policies. Figure 1 provides such a global perspective.

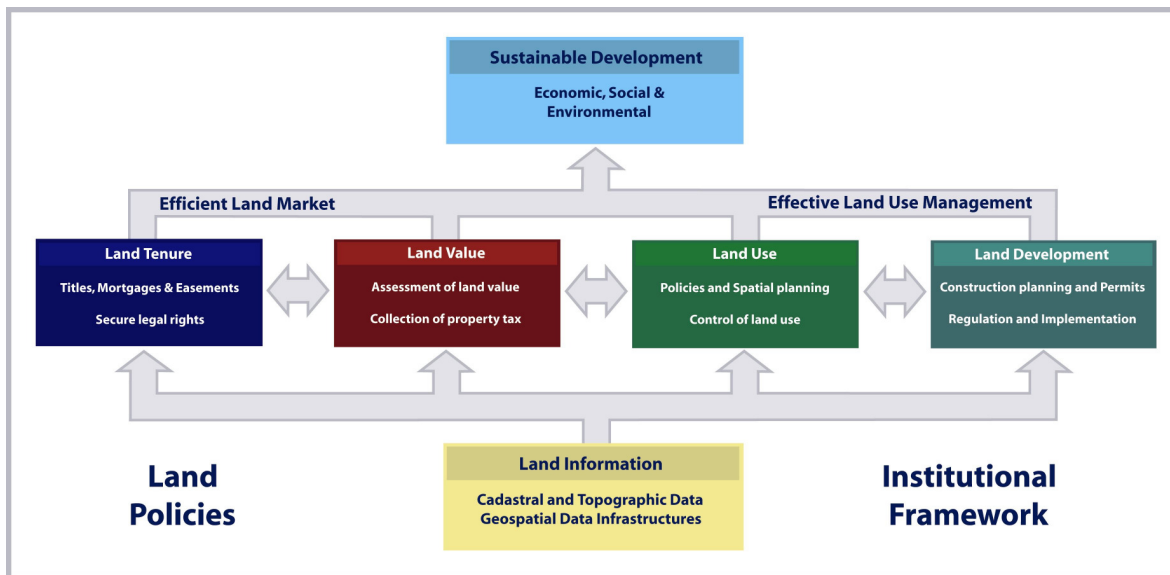


Figure 1. A Global Land Management Perspective (Enemark, 2004).

Land governance covers all activities associated with the management of land and natural resources that are required to fulfil political and social objectives and achieve sustainable development. The operational component of the concept is the range of land administration functions that include the areas of land tenure (securing and transferring rights in land and natural resources); land value (valuation and taxation of land and properties); land use (planning and control of the use of land and natural resources); and land development (implementing utilities, infrastructure, construction planning, and schemes for renewal and change of existing land use).

Land administration systems are the basis for conceptualizing rights, restrictions and responsibilities related to land and property. Property rights are normally concerned with ownership and tenure whereas restrictions usually control use and activities on land. Responsibilities relate more to a social, ethical commitment or attitude to environmental sustainability and good husbandry. In more generic terms, land administration is about managing the relations between people, policies and places in support of sustainability and the global agenda set by the MDGs.

Property Rights

In the Western cultures it would be hard to imagine a society without having property rights as a basic driver for development and economic growth. Property is not only an economic asset. Secure property rights provide a sense of identity and belonging that goes far beyond and underpins the values of democracy and human freedom. Historically, however, land rights evolved to give incentives for maintaining soil fertility, making land-related investments, and managing natural resources sustainably. Therefore, property rights are normally managed well in modern economies. The main rights are ownership and long term leasehold. These rights are typically managed through the cadastral/land registration systems developed over centuries. Other rights such as easements and mortgage are often included in the registration systems.

The formalized western land registration systems are basically concerned with identification of legal rights in support of an efficient land market, while the systems do not adequately address the more informal and indigenous rights to land that is found especially in developing countries where tenures are predominantly social rather than legal. Therefore, traditional cadastral systems cannot adequately supply security of tenure to the vast majority of the low income groups and/or deal quickly enough with the scale of urban problems. A new and innovative approach is found in the continuum of land rights (including perceived tenure, customary, occupancy, adverse possession, group tenure, leases, freehold) where the range of possible forms of tenure is considered as a continuum from informal to towards more formal land rights and where each step in the process of securing the tenure can be formalised (UN-Habitat, 2008).

Property Restrictions

Land-use planning and restrictions are becoming increasingly important as a means to ensure effective management of land-use, provide infrastructure and services, protect and improve the urban and rural environment, prevent pollution, and pursue sustainable development. Planning and regulation of land activities cross-cut tenures and the land rights they support. How these intersect is best explained by describing two conflicting points of view – the free market approach and the central planning approach.

The free market approach argues that land owners should be obligated to no one and should have complete domain over their land. In this extreme position, the government opportunity

to take land (eminent domain), or restrict its use (by planning systems), or even regulate how it is used (building controls) should be non-existent or highly limited.

The central planning approach argues that the role of a democratic government includes planning and regulating land systematically for public good purposes. Regulated planning is theoretically separated from taking private land with compensation and using it for public purposes. In these jurisdictions the historical assumption that a land owner could do anything than was not expressly forbidden by planning regulations changed into the different principle that land owners could do only what was expressly allowed, everything else being forbidden.

The tension between these two points of view is especially felt by nations seeking economic security. The question however is how to balance owners' rights with the necessity and capacity of the government to regulate land use and development for the best of the society. The answer to this is found in a country's land policy which should set a reasonable balance between the ability of land owners to manage their land and the ability of the government to provide services and regulate growth for sustainable development. This balance is a basis for achieving sustainability and attaining the MDGs.

Property Responsibilities

Property responsibilities are culturally based and relate a more social, ethical commitment or attitude to environmental sustainability and good husbandry. Individuals and other actors are supposed to treat land and property in a way that conform to cultural traditions and ways of good ethical behaviour. This relates to what is accepted both legally and socially. Therefore, the systems for managing the use of land vary throughout the world according to historical development and cultural traditions. More generally, the human kind to relationship is to some extent determined by the cultural and administrative development of the country or jurisdiction.

This relates to cultural dimensions as described by the Dutch scientist Gert Hofstede (2001), especially the dimensions of: *Uncertainty avoidance*, that is the preference of structured situations over unstructured or flexible ones; and *Power distance*, that is the degree of inequality among people accepted by the population. These cultural dimensions determine the social and ethical behaviour of people also in relation to the way land can be hold and used within a given culture. Systems of land tenure and land-use control therefore vary throughout the world according to such cultural differences.

Social responsibilities of land owners have a long heritage in Europe. In Germany, for example, the Constitution is insisting on the land owner's social role. In general, Europe is taking a comprehensive and holistic approach to land management by building integrated information and administration systems. Other regions in the world such as Australia creates separate commodities out of land, using the concept of "unbundling land rights", and is then adapting the land administration systems to accommodate this trading of rights without any national approach.

THE LAND MANAGEMENT PARADIGM

Land management underpins distribution and management of a key asset of any society namely its land. For western democracies, with their highly geared economies, land management is a key activity of both government and the private sector. Land management, and especially the central land administration component, aim to deliver efficient land markets and effective management of the use of land in support of economic, social, and environmental sustainability.

The land management paradigm as illustrated in figure 2 allows everyone to understand the role of the land administration functions (land tenure, land value, land use, and land development) and how land administration institutions relate to the historical circumstances of a country and its policy decisions. Importantly, the paradigm provides a framework to facilitate the processes of integrating new needs into traditionally organised systems without disturbing the fundamental security these systems provide.

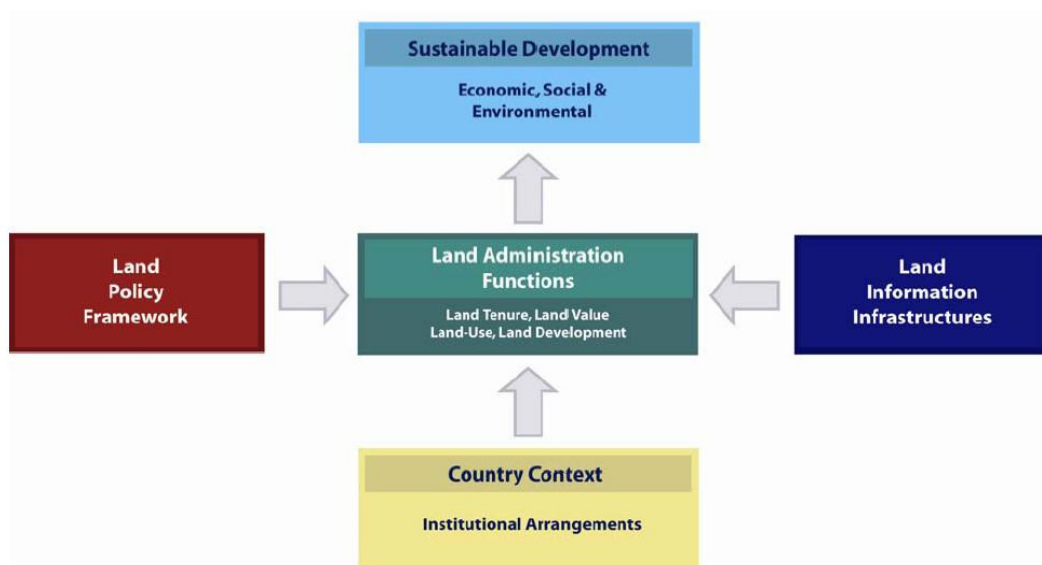


Figure 2. The land management paradigm (Enemark, 2004)

Sound land management requires operational processes to implement land policies in comprehensive and sustainable ways. Many countries, however, tend to separate land tenure rights from land use opportunities, undermining their capacity to link planning and land use controls with land values and the operation of the land market. These problems are often compounded by poor administrative and management procedures that fail to deliver required services. Investment in new technology will only go a small way towards solving a much deeper problem: the failure to treat land and its resources as a coherent whole.

Hierarchy of land issues

The response to change pressures in any particular jurisdiction will depend on how local leaders understand the vision. While the larger theoretical framework described above is futuristic for many countries, they must still design their land administration systems around the land management paradigm. A simple entry point showing how to do this uses a hierarchy of land issues in figure 3 showing how the concepts involved in the paradigm fit together in a hierarchical manner ranging from land policies to the land parcel.

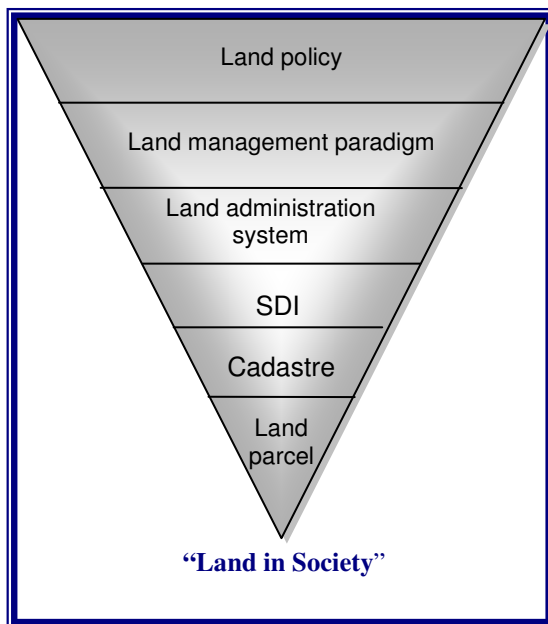


Figure 3. Hierarchy of land issues
(Williamson, Enemark, Wallace, Rajabifard, 2009)

Land Policy determines values, objectives and the legal regulatory framework for management of a society's major asset, its land.

Land Management includes all activities associated with the management of land and natural resources that are required to achieve sustainable development. These activities include the core land administration functions: land tenure, land value, land use and land development.

The **Land Administration System** provides the infrastructure for implementation of land policies and land management strategies, and underpins the operation of efficient land markets and effective and use management.

The **Spatial Data Infrastructure** provides access to and interoperability of the cadastral information and other land information.

The **Cadastre** provides the spatial integrity and unique identification of every land parcel usually through a cadastral map updated by cadastral surveys. The parcel identification provides the link for securing land rights and controlling land use.

The **Land Parcel** is the key object for identification of land rights and administration of restrictions and responsibilities in the use of land. The land parcel simply links the system with the people.

The hierarchy illustrates the complexity of organizing policies, institutions, processes, and information for dealing with land in society. But it also illustrates an orderly approach represented by the six levels. This conceptual understanding provides the overall guidance for building LAS in any society, no matter the level of development. The hierarchy also provides guidance for adjustment or reengineering of existing LAS. This process of adjustment should be based on constant monitoring of the results of the land administration and land management activities. The land policies may then be revised and adapted to meet the changing needs in society. The change of land policies will require adjustment of the LAS processes and practices that, in turn, will affect the way land parcels are held, assessed, used, or developed.

SPATIALLY ENABLED SOCIETY

Place matters! Everything happens somewhere. If we can understand more about the nature of “place” where things happen, and the impact on the people and assets on that location, we can plan better, manage risk better, and use our resources better. This will increase the success rate for new initiatives, assist in the reduction of the potential for future problems and give tangible financial benefits (Communities and Local Government, 2008).

Societies can be regarded as spatially enabled when location and spatial information are regarded as common goods made available to citizens and businesses to encourage creativity and product development (Wallace et.al. 2006).

Realizing this vision of spatially enabled society is dependent on the development of appropriate mechanisms to facilitate the delivery of data and services as presented in the European INSPIRE initiative (CEC, 2004).

A government service is regarded as spatially enabled when governments use **place** as the key means of organising their activities in addition to information, and “when the service delivery process incorporates seamless access to all information that a user of the service might need to make spatial or location-specific decisions associated with the service” (Ezigbalike et. al., 2009).

New distribution concepts such as Google Earth provide user friendly information in a very accessible way. We should consider the option where spatial data from Google Earth are merged with built and natural environment data. This unleashes the power of both technologies in relation to emergency response, taxation assessment, environmental monitoring and conservation, economic planning and assessment, social services planning, infrastructure planning, etc. This also include designing and implementing a suitable service oriented IT-architecture for organising spatial information that can improve the communication between administrative systems and also establish more reliable data based on the use of the original data instead of copies. Spatial enablement offers opportunities for visualisation, scalability, and user functionalities:

This is related to institutional challenges with a range of stakeholder interests. This includes Ministries/Departments such as: Justice; Taxation; Planning; Environment; Transport; Agriculture; Housing; Interior (regional and local authorities); Utilities; and civil society interests such as businesses and citizens. Creating awareness of the benefits of developing a shared platform for Integrated Land Information Management takes time and patience. The Mapping/Cadastral Agencies have a key role to play in this regard. The technical core of Spatially Enabling Government is the spatially enabled cadastre.

Significance of the Cadastre

The land management paradigm makes a national cadastre the engine of the entire LAS, underpinning the country's capacity to deliver sustainable development. The role of the cadastre as the engine of LAS is neutral in terms of the historical development of any national system, though systems based on the German and Torrens approaches, are much more easily focused on land management than systems based on the French/Latin approach.

The cadastre as an engine of LAS is shown diagrammatically in figure 4. The diagram highlights the usefulness of the large scale cadastral map as a tool by exposing its power as the representation of the human scale of land use and how people are connected to their land. The digital cadastral representation of the human scale of the built environment, and the cognitive understanding of land use patterns in peoples' farms, businesses, homes, and other developments, then form the core information sets that facilitate a country building an overall administrative framework to deliver sustainable development in a country.

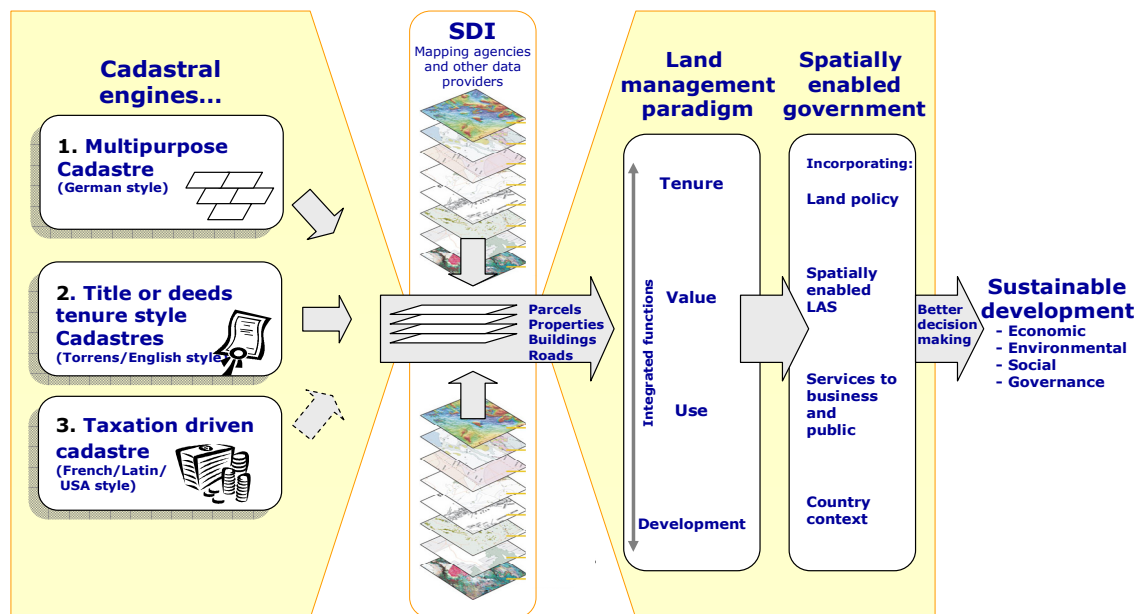


Figure 4. Significance of the Cadastre (Williamson, Enemark, Wallace, Rajabifard 2009)

The diagram demonstrates that the cadastral information layer cannot be replaced by a different spatial information layer derived from geographic information systems (GIS). The unique cadastral capacity is to identify a parcel of land both on the ground and in the system in terms that all stakeholders can relate to, typically an address plus a systematically generated identifier (given addresses are often duplicated or are otherwise imprecise). The core cadastral information of parcels, properties and buildings, and in many cases legal roads, thus becomes the core of SDI information, feeding into utility infrastructure, hydrological, vegetation, topographical, images, and dozens of other datasets.

Good governance

Governance refers to the manner in which power is exercised by governments in managing a country's social, economic, and spatial resources. It simply means: the process of decision-making and the process by which decisions are implemented. This indicates that government is just one of the actors in governance. The concept of governance includes formal as well as informal actors involved in decision-making and implementation of decisions made, and the formal and informal structures that have been set in place to arrive at and implement the decision. Good governance is a qualitative term or an ideal which may be difficult to achieve. The term includes a number of characteristics: (adapted from FAO, 2007):

- **Sustainable and locally responsive:** It balances the economic, social, and environmental needs of present and future generations, and locates its service provision at the closest level to citizens.
- **Legitimate and equitable:** It has been endorsed by society through democratic processes and deals fairly and impartially with individuals and groups providing non-discriminatory access to services.
- **Efficient, effective and competent:** It formulates policy and implements it efficiently by delivering services of high quality
- **Transparent, accountable and predictable:** It is open and demonstrates stewardship by responding to questioning and providing decisions in accordance with rules and regulations.
- **Participatory and providing security and stability:** It enables citizens to participate in government and provides security of livelihoods, freedom from crime and intolerance.
- **Dedicated to integrity:** Officials perform their duties without bribe and give independent advice and judgements, and respects confidentiality. There is a clear separation between private interests of officials and politicians and the affairs of government.

Once the adjective “good” is added, a normative debate begins. In short: sustainable development is not attainable without sound land administration or, more broadly, sound land management.

CLIMATE CHANGE AND NATURAL DISASTERS

The UN secretary general Ban Ki-moon has stated that “climate change is the defining challenge of our time”. He said that combining the impacts of climate change with the current global financial crisis we risk that all the efforts that have been made by countries to meet the Millennium Development Goals and to alleviate poverty, hunger and ill health will be rolled back. It is clear that those who suffer the most from the increasing signs of climate change are the poor. Those that contributed the least to this planetary problem continue to be disproportionately at risk.

On the other hand the global challenge of climate change also provides a range of opportunities. The Executive Director of UN-Habitat Dr. Anna Tibaijuka have said that prevention of climate change can be greatly enhanced through better land-use planning and building codes so that cities keep their ecological footprint to the minimum and make sure that their residents, especially the poorest, are protected as best as possible against disaster.

This also relates to the fact that some 40 percent of the world's population lives less than 100 km from the coast mostly in big towns and cities. A further 100 million people live less than one metre above mean sea level.

“Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and the rising of the global average sea level” (IPCC, 2007). The science is confirmed and leaves no doubt – climate change is real, and it is already happening.

Adaptation to and mitigation of climate change, by their very nature, challenge professionals in the fields of land use, land management, land reform, land tenure and land administration to incorporate climate change issues into their land policies, land policy instruments and facilitating land tools (Molen, v. d. P., 2009). No matter the inequity between the developed and developing world in terms of emissions and climate consequences, there is a need to develop relevant means and measures for adaptation to climate change both in both the rich and the poorer countries.

More generally, sustainable land administration systems should serve as a basis for climate change adaptation and mitigation as well prevention and management natural disasters. The management of natural disasters resulting from climate change can also be enhanced through building and maintenance of appropriate land administration systems. Climate change increases the risks of climate-related disasters, which cause the loss of lives and livelihoods, and weaken the resilience of vulnerable ecosystems and societies.

Adaptation to climate change can be achieved to a large extent through building sustainable and spatially enabled land administration systems. This should enable control of access to land as well as control of the use of land. Such integrated land administration systems should include the perspective of possible future climate change and any consequent natural disasters. The systems should identify all prone areas subject to sea-level rise, drought, flooding, fires, etc. as well as measures and regulations to prevent the impact of predicted climate change.

Key policy issues to be addressed should relate to protecting the citizens by avoiding concentration of population in vulnerable areas and improving resilience of existing ecosystems to cope with the impact of future climate change. Building codes may be essential in some areas to avoid damage e.g. in relation to flooding and earthquakes. Issues may also relate to plans for replacement existing settlements as an answer to climate change impacts.

The measures of building integrated and spatially enabled land information systems does not necessarily relate to the inequity between the developed and less developed countries. Implementation of such systems will benefit all countries throughout the globe. Therefore, the integrated land administration systems should, in addition to appropriate registration of land tenure and cadastral geometry, include additional information that is required about

environmental rating of buildings, energy use, and current and potential land use related to carbon stock potential and greenhouse gases emissions.

This also relates to the fact that climate change is not a geographical local problem that can be solved by local or regional efforts alone. To address climate change, international efforts must integrate with local, national, and regional abilities.

No matter the inequity between the developed and developing world in terms of emissions and climate consequences, there is a need to develop relevant means and measures for adaptation to climate change both in both the rich and the poorer countries.

THE ROLE OF FIG

FIG is an UN recognised NGO representing the surveying profession in about 100 countries throughout the world. FIG has adopted an overall theme for this period of office (2007-2010) see http://www.fig.net/admin/ga/2007/app_12_01_council_workplan.pdf. The theme “Building the Capacity” applies to the need for capacity building in developing countries to meet the challenges of fighting poverty and developing a basis for a sustainable future, and, at the same time, capacity is needed in developed countries to meet the challenges of the future in terms of institutional and organisational development in the areas of surveying and land administration.

In general, FIG will strive to enhance the global standing of the profession through both education and practice, increase political relations both at national and international level, help eradicating poverty, promote democratisation, and facilitate economic, social and environmental sustainability. FIG can facilitate support of capacity development in three ways:

- **Professional development:** FIG provides a global forum for discussion and exchange of experiences and new developments between member countries and between individual professionals in the broad areas of surveying and mapping, spatial information management, and land management. This relates to the FIG annual conferences, the FIG regional conferences, and the work of the ten technical commissions within their working groups and commission seminars. This global forum offers opportunities to take part in the development of many aspects of surveying practice and the various disciplines including ethics, standards, education and training, and a whole range of professional areas.
- **Institutional development:** FIG supports building the capacity of national mapping and cadastral agencies, national surveying associations and survey companies to meet the challenges of the future. FIG also provides institutional support to individual member countries or regions with regard to developing the basic capacity in terms of educational programs and professional organisations. The professional organisations must include the basic mechanisms for professional development including standards, ethics and professional code of conduct for serving the clients.

- **Global development:** FIG also provides a global forum for institutional development through cooperation with the United Nations Agencies such as FAO, UN-HABITAT and the World Bank. The cooperation includes a whole range of activities and joint projects such as the joint FIG/WB conference on Land Governance in support of the MDGs held in Washington May 2009 (<http://www.fig.net/wb2009/>). This should lead to joint efforts of addressing topical issues on the international political agenda, such as reduction of poverty and enforcement of sustainable development.

FIG, this way, plays a strong role in improving the capacity to design, build and manage surveying and land administration systems that incorporate sustainable land policies and efficient spatial data infrastructures towards building spatially enabled societies in support of the Millennium Development Goals.

FINAL REMARKS

No nation can build land management institutions without thinking about integration of activities, policies, and approaches. Technology opportunities provide additional motivation. Careful management of land related activities on the ground are crucial for delivery of sustainability.

Land administration systems, in principle, reflect the social relationship between people and land recognized by any particular jurisdiction or state. Such a system is not just a GIS. On the other hand, Land Administration Systems are not an end in itself but facilitate the implementation of the land policies within the context of a wider national land management framework.

Sustainable land administration systems provide clear identification of the individual land parcels and land rights attached to these parcels. This information on the people to land relationship is crucial and plays a key role in managing a wide range of activities in society including adaptation to climate change and disaster risk management.

The land management perspective and the operational component of integrated and spatially enabled land administration systems therefore need high-level political support and recognition.

BIOGRAPHICAL NOTES

Stig Enemark is President of the International Federation of Surveyors, FIG 2007-2010. He is Professor in Land Management and Problem Based Learning at Aalborg University, Denmark, where he was Head of School of Surveying and Planning 1991-2005. He is a well known international expert in the areas of land administration systems, land management and spatial planning, and related educational and capacity building issues. He has published widely in these areas and undertaken consultancies for the World Bank and the European Union especially in Eastern Europe, Sub Saharan Africa.

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